

Request for Additional Information No. 117 (1281, 1305), Revision 0

11/14/2008

U. S. EPR Standard Design Certification

AREVA NP Inc.

Docket No. 52-020

SRP Section: 05.02.02 - Overpressure Protection

SRP Section: 05.04.11 - Pressurizer Relief Tank

Application Section: FSAR Ch. 5

QUESTIONS for Reactor System, Nuclear Performance and Code Review (SRSB)

05.02.02-1

(Intentionally deleted)

05.02.02-2

(Intentionally deleted)

05.02.02-3

Section 5.2.2.2.2, Low Temperature Overpressure Protection, states that “Two mass input events – start of four MHSI pumps with one large miniflow line closed, and both charging pumps running with control valve failed open – and one heat input event – startup of an RCP with the secondary side hotter than the primary side – were selected for analysis. The other overpressure events are bounded by the analyzed events.” What were the analytical methods used for the analyses and the justifications for the choice of scenarios that were analyzed and single failures chosen to show how they are bounding and in compliance with GDC 31at it relates to the LTOP for the U.S. EPR design?

05.02.02-4

GDC 30 requires that the PSRVs, as part of the RCPB, be tested to the highest quality standards practicable. The staff also noted that the Section 5.0 Acceptance Criteria of Test # 037 Pressurizer Safety Valve refers to “Section 5.4.11.” However, Section 5.4.11 presents information related to the PZR Relief Tank. Does Section 5.4.11 contain the correct acceptance criteria reference for Test #37, or is there another section containing the criteria?

05.04.11-2

FSAR Tier 2 Section 5.4.11.3 states:

“Functional failure of the non-safety-related PRT and associated piping has no impact on safe plant shutdown. The PRT and associated piping are located so that:

- A failure will not preclude essential operations of safety-related systems.
- PRT rupture disks are not a missile threat to safety-related equipment.

Section 3.5 addresses protection against internally generated missiles for safety-related systems and components. Section 1.7 contains general arrangement and layout drawings for structures and systems.”

A review of Section 3.5 did not result in any reference to PRT in the context of the impact of generated missile due to PRT and associated piping failure or the missile behavior of a rupture disk. This information is needed to establish that GDC 4 is met. Where is the generation of these missiles and their impact specifically addressed and analyzed? Has there been any failure modes and effects analyses performed?

05.04.11-3

There is no reference in 5.4.11 of the potential environmental impact of PRT and associated piping failures. This information is needed to establish that GDC 4 is met. The following related concern states:

“The discharge of the rupture disks is directed towards an opening in the floor of the cubicles for RCPs two and three (RCP bunker). The discharge is routed such that any flow will not impact any safety-related components in the cubicle.”

Has the harsh environmental conditions (such as temperature, humidity and radiation) that would be created by the discharge from a rupture disk of the PRT been considered as a potential impact on any safety related equipment or components in the affected area?

05.04.11-4

In Section 5.4.11.1, it is stated:

“The PRT design incorporates two rupture disks that protect the PRT from overpressurization. The flow area of one rupture disk is larger than the PSRV discharge pipe and greater than what is required to handle the full flow rate of three PSRVs. The rupture disks prevent the PRT pressure from exceeding the design limits.”

Please explain the purpose of the second rupture disk. Is it to add redundancy and enhance defense in depth?

05.04.11-5

The FSAR Tier 2 Section 5.4.11.3 states: “Section 1.7 contains general arrangement and layout drawings for structures and systems.”

A review of Section 1.7 did not result in any general arrangement and layout drawings pertaining to PRT. Please provide such drawings. Discuss how they were used to assess whether other SSCs inside containment are protected from the effects of high-energy line breaks and moderate-energy leakage cracks in the pressurizer relief system. This information is needed to establish that GDC 4 is met. (Relevant to **RAI 5.4.11-2**)

05.04.11-6

The FSAR Tier 2 Section 5.4.11.5 states: “The PRT is designed with instrumentation nozzles for pressure, level and temperature measurements. The MCR alarms indicate high pressure, temperature, and high and low water levels. The instrumentation nozzles are located to allow measurements in both the liquid and gaseous phases.”

The FSAR Tier 2 Figure 5.1-4, Sheet 3 of 7, shows pressure, temperature and level instrumentation. The staff did not readily identify any additional references to the PRT instrumentation in the FSAR Tier 1 and Tier 2, including initial testing and ITAAC related to MCR alarms. Please explain

05.04.11-7

To assure completeness and accuracy of the plant design and licensing basis, one minor error and one minor inconsistency were identified in the review of FSAR Tier 2 Section 14.2.12.3.14, Pressurizer Safety Valve. Section 5.0, Acceptance Criteria states that safety valves perform as described in Section 5.4.11. The staff concluded that even though the Pressurizer Safety and Relief Valves (PSRVs) are mentioned in Section 5.4.11, their performance is addressed in Section 5.4.13, Safety and Relief Valves. Also, FSAR Section 14.2 refers to the Pressurizer Safety and Relief Valves as Pressurizer Safety Valves.